CLAIMS

1. Continuous method for producing a printed retroreflective material for making articles of clothing, said articles of clothing having aesthetic look, good laundering durability and high visibility corresponding to specific requirements for a minimum coefficient of retro-reflection ($cd/lx.m^2$) indicated by European Standard EN 471/1994 (related to high visibility warning clothing) and/or EN 13356/2001 (related to visibility accessories for non-professional use), said method comprising the steps of:

(a) providing a carrier sheet with an adhesive on the carrier;

(b) partially embedding onto the adhesive a monolayer of transparent glass microspheres having a refractive index between about 1.4 and about 2.7, to a depth averaging around 35-40 percent of their average diameters;

(c) coating a thin layer of a two-component polyurethane resin;

(d) applying a specularly reflective mirror of aluminum by vacuum deposition;

(e) printing a non-etchable pattern onto the aluminum layer;

(f) passing said web material through a demetallization bath of sodium hydroxide and a washing station to remove etchable, non-protected surface and drying the web;

(g) applying, by a vacuum process, two layers of dielectric mirror;

(h) coating a polyurethane binder layer and laminate with a textile base;

(i) stripping away the support layer.

2. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the carrier sheet has an heat-softenable adhesive layer on the carrier.

3. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the carrier sheet is an auto-adhesive layer supported by a polymer backing.

4. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the polyurethane resin is a reaction product of a polyester polyol having a number molecular weight of at least 2,000 and a polyisocyanate.

5. Method for manufacturing a printed retroreflective material according to Claim 4, characterised in that the dry polyurethane resin on the glass beads is less than about 3 g/sqm of dry substance.

6. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the polyurethane resin used for coating the glass web is a water-dispersion and the curing agent is an aliphatic poly-isocyanate.

7. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the polyurethane resin used for coating the glass web is a polyester polyol isocyanate in solvent and the curing agent is a polyester polyisocyanate.

8. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the transfer image used for printing the coated microspheres is made with a non-etchable NaOH resin.

9. Method for manufacturing a printed retroreflective material according to Claim 8, characterised in that the

thermoplastic resin used for the printed base is a polyurethane, a polyamide or a polyacrilic polymer.

10. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the base transfer non-etchable printing is a release paper, a polypropylene or polyester foil.

11. Method for manufacturing a printed retroreflective material according to Claim 10, characterised in that the transfer printed base is Decotrans®, manufactured by Miroglio, Italy.

12. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the non-etchable transfer pattern is replaced by a silk-screen printing or roll printing on the reflective aluminum layer.

13. Method for manufacturing a printed retroreflective material according to Claim 1, characterized in that the transparent dielectric mirror is a layer of aluminum sodium fluoride (Na_3AlF_6) overlaid by a layer of zinc sulfide (ZnS).